REMARKS

Election/Restriction

The Office has made a restriction requirement in accordance with 35 U.S.C. §121 between:

Species I: Claims 1-7, drawn to a plasma processing apparatus.

Species II: Claims 8-18, drawn to a method of plasma cleaning.

Species III: Claims 19-21, drawn to a method of deposition using plasma processing.

In response to the Office's restriction requirement, election is hereby made to without traverse to prosecute the invention of species I, claims 1-7. Claims 8-21 have been withdrawn without prejudice.

The applicant, however, is compelled to address the substantive questions of patentability raised by the Office in its action to which this is a response. In particular, the applicant respectfully disagrees with the Office's allegations that US Pat. Nos. 5,766,364 of Ishida et al., 6,538,872 of Wang et al., and 6,189,482 of Zhao et al. render the technical features of the claimed invention to be unpatentable, seemingly on the basis of obviousness.

The three cited references, either alone or in combination, fail to disclose the claimed system. The '364 reference fails to disclose cleaning of substrates, and approximates the processing references discussed in the background of the application, with the same disadvantages as those approaches. The electrode and heater structure of the cited reference is not consistent with the claimed elements of claim 1. The applicant submits that the substantial improvement of performance of the claimed invention over the cited '364 reference's technology is ample evidence of the non-obviousness of the claimed invention.

The '364, does not address the problems associated with plasma cleaning of a processing chamber, and one of ordinary skill in the art would not be likely to combine the references to yield an invention to solve a problem that is unacknowledged by the '364 reference or the other cited references.

Similarly, the cited '482 reference discloses a structure including an RF plate as an electrode, and a heater spaced from the electrode with an AlN plate. The applicant draws the Office's attention to Figure 7A and its corresponding description beginning at Col18, ll. 65. The applicant respectfully submits that the cited '482 reference appears not to describe, as alleged in paragraphs 11 and 12, that the claimed ratio of the thickness of the electrode to the heater- i.e. X to Y encompasses the range of 1.2X to 3X. The element 103 (a Mo RF plane of thickness "5 mil") is separated from the heater 107 by an AlN element 105. It is noted that claim 1 defines Y as the distance between the upper surface (upon which the "substrate is placed") and the plane defining the top of the heater 107. Furthermore in '482 the substrate is placed upon the upper surface of the top plate 101 (also AlN).

The applicant also respectfully submits that the ceramic AlN is specifically discussed as prior art by the '482 reference and its difficulties discussed:

> Typically harder and more brittle than metals, ceramic materials may be difficult to machine, thereby requiring a simple mechanical design. Being somewhat brittle, ceramic may crack from thermal shock if repeatedly subjected to a sufficient thermal gradient. Cracking may also arise from the differential thermal expansion at the transition from the ceramic heater assembly to a material with a different thermal expansion coefficient. Even joining ceramic parts fabricated from the same material is a challenge because many assembly methods and devices used to assemble metal parts, such as welding, bolting, brazing and screwing, may be unreasonably difficult or unreliable when attempted with ceramic parts.

The applicant, therefore, submits that one skilled in the art would not have modified the '364 reference with the '482 reference as the alleged by the Office, and that should one have modified the '364 reference in the proposed way, the result would not have yielded the claimed invention.

The Office uses the '872 reference only to provide a nickel alloy electrode. The applicant respectfully disagrees with the Office's allegations regarding the interchangeability of the electrode of the '872 reference, as such a combination again fails to address the core problems addressed by the claimed invention- improved performance in cleaning of process chambers. In no way does the '872 reference address the issue of cleaning, nor addresses the structure of the

claimed invention. At least for these reasons, the applicant respectfully submits that the claimed invention is patentably distinct from the cited references, either alone or in combination.

Applicant believes the above amendments and remarks to be fully responsive to the Office Action, thereby placing this application in condition for allowance. No new matter is added. Applicant requests speedy reconsideration, and further requests that Examiner contact its attorney by telephone, facsimile, or email for quickest resolution, if there are any remaining issues.

Respectfully submitted,

/Andrew P. Cernota, Reg. No. 52,711/

Vernon C. Maine, Reg. No. 37,389
Andrew P. Cernota, Reg. No. 52,711
David A. Rardin, Reg. No. 52,153
Attorneys/Agents for Applicant

Cus. No. 24222
Vern Maine & Associates
PO Box 3445
Nashua, NH 03061-3445
Tel. No. (603) 886-6100, Fax. No. (603) 886-4796
patents@vernmaine.com